

RFP – DHSES (Orthos) 01-2013
Amendments to the RFP
December 6, 2013

Amendment # 2

In **Exhibit A – Project Scope of Work**, on **pages 57-59**, replace *Sections A.2.4.1 Horizontal Ground Control* and *Section A.2.4.2 Vertical Ground Control* with the following:

A.2.4.1 Horizontal Ground Control

The intent of establishing control points for the Program is to orient the source imagery. Control survey methods must produce coordinates which can support the requirements in the image orientation phase. Documenting new point locations increases the likelihood the points can be re-used in future years.

All horizontal control points surveyed for this project must be tied to the NYSDOT CORS for horizontal control and reported on the NAD 83(2011) datum in New York State Plane Coordinate System (SPCS) U.S. Survey Feet.

Surveys to establish these horizontal control points must use differential dual-frequency Global Positioning System (GPS) receivers. If a Contractor uses observations from the Russian GLONASS system, the Contractor must account for this in the control report and data files.

All GPS surveys shall meet the following minimum accuracy standards:

- Independent observations on new control points must agree within 0.08-ft in X and Y
- Observations on existing control of a higher accuracy must agree with the published coordinates within 0.08-ft in X and Y

GPS surveys shall be performed using accepted procedures, such as post-processed static differential survey techniques or real-time kinematic (RTK) surveys. Bidders must describe their planned technique(s) in their proposal. Bidders considering post-processed static techniques are advised to consult the requirements in “Geometric Geodetic Accuracy Standards And Specifications For Using GPS Relative Positioning Techniques”, Federal Geodetic Control Subcommittee, August, 1989. Bidders considering RTK surveys are advised to consult the requirements described in Chapter 10 of the “NYSDOT Land Surveying Standards and Procedures Manual” at (<https://www.dot.ny.gov/divisions/engineering/design/design-services/land-survey/standards-procedures>).

Reference stations shall have coordinates of an accuracy exceeding the accuracy required for control points. Each new control point shall have two or more independent station occupations. Independent occupations require that the tripod or stand be reset and re-plumbed between sessions. Sessions shall be separated by at least twenty (20) minutes. Any network or sub-network for each survey shall consist solely of independent, non-trivial baselines. Only processed baselines that have fixed ambiguity resolutions shall be included in the network.

The Contractor shall document the survey process and report accuracy of the horizontal control points in sufficient detail to allow the State to confirm the results. Bidders must describe this narrative and report format in their proposal. Bidders considering a network solution are advised to consult the “GEOSPATIAL POSITIONING ACCURACY STANDARDS Part 2: Standards for Geodetic Networks developed by the Federal Geodetic Control Subcommittee (FGCS) and the Federal Geographic Data

Committee (FGDC)", 1996.

Proposed GPS observations procedures shall specify acceptable standards for the following parameters as well as any other relevant conditions or techniques:

- Minimum baseline observation times
- Minimum number of satellites observed and maximum PDOP
- Minimum epoch rate or frequency

The following are typical Contract deliverables as part of a final survey report and adjustment, with variations depending on the survey method(s) used. The State and Contractor will develop a final format for the report during control planning at the Pre-Flight Meeting.

- All GPS Observation Data in proprietary format and RINEX2 data format written to CD or DVD.
- A network diagram showing all points and indicating which independent vectors were observed
- A schedule (in table form) showing the dates, occupation times, and sessions for each station in the survey
- Observation form for each independent station occupation that shall include at least the following information:
 - o Project Name
 - o Operator's Name
 - o Date
 - o Julian Day
 - o Receiver Serial #
 - o Antenna Serial #
 - o Brand and name of receiver / antenna
 - o Station Name
 - o Session #
 - o Antenna H.I. and indication for type of measurement
 - o File Name
 - o Actual start time and actual end time for the occupation
- Photos of the new control point established
- Visibility skyplots for each station observed in the network
- Printed graphical plot indicating the number of satellites above fifteen (15) degrees and the PDOP for each session of field observation
- Data showing the quality of independent occupations of new points and occupations of existing points
- Data showing the quality of processed vectors
- Loop closure results for all baselines (Valid loop closures must contain vectors from a minimum of two (2) different independent observing sessions following FGDC guidelines)
- Results of a minimally constrained least squares network adjustment report including (@ ninety-five percent [95%] confidence region):
 - o Statistical results clearly showing which control point is held fixed, and clearly indicating standard errors applied and weighting scheme used
 - o Station coordinate standard deviations (x,y,z)
 - o Station coordinate error ellipses (semi-major axis, semi-minor axis, azimuth of semi-major axis, height)
- Results of the fully constrained adjustment, clearly showing all values held fixed, and clearly indicating standard errors applied and weighting scheme used.

The Contractor must submit a control plan prior to fieldwork showing the location of stations to be observed and indicating the procedures to be used to locate each new point. The Contractor shall be required to permanently monument and document to the State additional control points where permanent monumentation does not exist. Tie-diagram and “to Reach” descriptions will be needed for each new point.

All new and existing horizontal control points, targeted or photo-identifiable, planned for use in an annual lot shall be submitted in ESRI ArcView point feature shape files. A separate set of shape files shall be submitted for SPCS and NAD 83(2011) UTM Zone 18 versions of the horizontal control points, each point attributed with X-Y coordinates in SPCS U.S. Survey Feet or UTM meters and a brief description of each point in sufficient detail to identify the point for future use.

A.2.4.2 Vertical Ground Control

All control points used as horizontal control for the annual lot shall be used as vertical control as well. The Geoid12A model for New York State offered by the National Geodetic Survey (NGS) shall be used to reduce ellipsoid heights to orthometric heights (NAVD 88) in both U.S. Survey Feet and meters (www.ngs.noaa.gov/GEOID/GEOID12/). The Contractor must document offsets between paneled targets and the ground elevation of the vertical control point if such offsets exist.

Any additional vertical control required for the annual lot shall be derived from GPS surveys as prescribed in 2.4.1 above using Geoid12A to determine orthometric heights in both U.S. Survey Feet and meters. The surveys shall meet the following minimum accuracy standards:

- Independent observations on new control points must agree within 0.15-ft in Z
- Observations on existing control of a higher accuracy must agree with the published coordinates within 0.15-ft in Z

Vertical control points shall be included in the ESRI ArcView point feature shape files of horizontal control points specified in 2.3.1 above, with additional fields to record their elevations in feet and meters.